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ABSTRACT

Those shaping the vocational-technical education program in Zimbabwe can learn much from the factors that influenced vocational education in the United States; the problems U.S. vocational education encountered; and the structure and content of American vocational and technical education. Accordingly, Zimbabwe's vocational leaders must encourage serious education; establish a vocational association to sponsor conferences and publish a journal; form an advisory committee of people with diverse backgrounds to advise the government, labor, and ministries of education; require teacher education program recruits to have several years' experience in their vocational field; and make passing one's examinations a condition of tenure for teachers. The cooperative education program (called "twinning" in Zimbabwe) should be expanded. Students at technical colleges should remain in residence for 2 years (instead of 1) before serving as a practice teacher during their third year. The private sector must become involved in planning and implementing vocational education. Teachers' colleges should build nursery schools that can be run as part of the home economics teacher education program, as is the one at Great Oaks Joint Vocational School in Cincinnati, Ohio. Greater emphasis should be given the recommendations of the head and staff of vocational education institutions. (CML)

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VOCATIONAL EDUCATION IN AMERICA: LESSONS FOR ZIMBABWE

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Vocational Education in America: Lessons for Zimbabwe

The purpose of this study is to obtain some insights into the structure and content of American vocational and technical education, the problems which have been encountered in shaping the vocational education program and the factors which necessitated its introduction. The insights so gained, will be useful to me as a Zimbabwean and to many of my colleagues who are presently engaged in shaping a vocational/technical education program for Zimbabwe. The country has just announced a new program of education which has a vocational/technical bias. The people who will implement this program need to widen their own horizons so that the vocational component can be implemented imaginatively, pragmatically and efficiently. In this context, lessons from other countries can only be invaluable, as long as it is borne in mind that we cannot directly transplant any system into Zimbabwe because the objective industrial, economic, and social conditions are not the same. But we insist that certain positive aspects of the American or other systems, for that matter, may still provide valuable lessons for Zimbabwe. The state of Ohio will be used as a case study.

During the early years of the twentieth century, America experienced a rapid expansion of industrial and urban centers. She was transformed from a nation having a simple rural economy, into one of the greatest industrial nations in the world. Many individuals and organizations began to question the philosophy of the prevailing system of education. Some began to advocate what

one scholar has termed, 'the concept social efficiency' in education.[1] This concept calls for the direct teaching of knowledge, attitudes, and skills, intended to shape the individual to predetermined social characteristics. It seeks to improve society by making its members more vocationally useful and socially responsible. The fundamental task of the school, therefore, was to prepare the child for life in civilized society. Education should exercise a form of social control by initiating the individual into existing cultural and social institutions. The Americans admired Germany's education system. By this time, Germany had, in addition to its school system, established an extensive network of separately administered vocational and technical schools. The prevailing view therefore was that the purpose of the school should be to meet the training needs of both workers and industry.

A discussion of the early twentieth century would be incomplete without touching on the work of David Snedden. Snedden started to work on his doctoral degree at Columbia University under Edward Lavine, a renowned social worker. In his works Snedden later suggested that a concerted effort ought to be made to determine the probable destination of each individual in society and to prescribe a curriculum especially suited to promote his ultimate efficiency. Children should be streamed into groups or classes of approximately similar capacities, interests, and

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[1]"The Snedden Prosser Social Efficiency Paradigm of Vocational Education," Journal of Industrial Teacher Education, Vol 25 No. 1, p. 31.

economic conditions. Snedden insisted that only under segregation was it possible to administer to each class the training most appropriate to that class.[2] The role of the educator was to identify what selective habits, what items of knowledge, and what ideas must be engendered into pupils of various abilities to achieve the correct moral and vocational training.[3] Of course the Snedden model was criticized by people like John Dewey, who saw it as a form of social industrial predestination. They objected to the creation of social classes and preferred a system that would not divide society into a clearly defined class structure.

The rapid industrialization which we mentioned earlier took place at a time when there was growing disinterest in traditional education among the youth. For example in the school year 1908-09 the number of students in various levels of the school system were as follows; 93 percent in elementary school, 4 percent in secondary school, and 3 percent at college.[4] Hence, there was a shocking dropout rate between elementary and secondary levels. It appeared that the traditional academic curriculum did not provide the motivation to keep the majority of youth in school. Moreover, those who dropped out could not find jobs because they did not possess the necessary skills for industry. The vocational

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[2]Ibid. p. 35.

[3]Ibid.

[4]M. E. Barlow, The Unconquerable Senator Page, The American Vocational Association, Inc., Washington, DC: 1976, p. 17.

movement in U.S. education, was therefore led by a small group of people, who wanted to provide courses which would lead to employment in the school curriculum. It was hoped that vocational education would kill two birds with one stone. Firstly, it would keep more students in school longer as it would be more interesting than traditional education. Secondly, it would provide a practical side to the curriculum which would supplement the academic emphasis by its inclusion of courses that would have a definite relevance to the daily lives of students.

In 1905 the Douglas Commission was appointed by the Governor of Massachusetts, William Douglas, to look at the need for industrial education of a vocational nature. Following the report of the Douglas Commission the National Society for the Promotion of Industrial Education was launched in New York in 1906.[5] It set itself the task of convincing the public of the need for public education to provide preparation for industrial occupations. The American Federation of Labor soon set up a committee to prepare what was to be a bill to be presented to Congress. The so called Dollieer-Davis Bill was presented to Congress in 1910. This bill provided for the preparation of teachers of vocational subjects and for the appropriation of money and for the regulation of its expenditure. The bill failed, but its revised version was again presented to Congress in 1911 by Senator Carroll Page of Vermont. After further delays, the bill

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[5]M. L. Barlow, History of Industrial Education in the United States, Chas. A. Bennett Co. Ltd., Peoria, 1967, p. 54.

was finally passed into law in January 1914. It was now known as the Smith-Leuer Bill. It basically authorized the President to appoint a commission which would look at funding and other relevant issues relating to vocational education. This Commission was appointed in the same year 1914. In its report it made the following observations:

(a) it endorsed the need for vocational education

(b) recommended national grants to the states for vocational education

(c) identified the kinds of vocational education for which national grants would be made

(d) recommended aid to vocational education through federal grants and justified national grants on the basis of interstate and national character of the problem.[6]

It was not long after the report of the Commission was published that the Smith-Hughes Act went into the making. It is important to bear in mind the fact that by this time, the demand for semi-skilled artisans was greater than that of skilled ones. The science of management had changed the organization of work. Decisions were now being made by professionally trained mangers. It was now more important for workers to be able to manipulate technologically advanced equipment rather than understand scientific concepts.[7] The establishment of vocational education institutions thus became a matter of urgency. The Smith-Hughes Bill which became law on February 23, 1917, provided for the promotion of vocational education and for cooperation with

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[6]Ibid.

[7]M. E. Barlow, The Unconquerable Senator Page, p. 9.

states in the promotion of such education. It also provided for the training of teachers of vocational subjects and the appropriation and regulation of funds for the purpose.

The principles of vocational education established between 1906 and 1917 are important. All of them relate to the needs of the economy and the social structure. They relate to people and the work they do. As the society and the economic structure change, it is reasonable to expect a reinterpretation of these principles. The system of vocational education is a system in which principles do not change but must be reinterpreted to achieve the goals of contemporary times.

Following the enactment of the Smith-Hughes Act, there came into being, a number of professional associations which greatly influenced the development of vocational education in America. People involved in the shaping up of vocational education needed to be part of such associations in order to reassure and question themselves continuously about the nature, motives, values, and direction of their work. An individual was limited to develop a set of values upon which vocational education could grow. Professional associations, on the other hand, provided the environment in which the considered judgement of a group could be sharpened thus providing for each person a wider framework of values from which individuals could find better direction.

By 1918 six professional associations in industrial or vocational education had become prominent nationally. These were, the Eastern Arts Association, Western Arts Association, National

Society of Vocational Education, Vocational Education Association of the Middle West, the Manual Arts Conference, and the Department of Vocational Training and Practical Arts of the National Education Association.[8] In 1926, the American Vocational Association joined in. These associations, took upon themselves the task of interpreting the social implications of vocational education and acted as centers of action in the growth of industrial education. These professional associations played such a crucial role in the development of vocational education that E. M. Barlow now suggests that 'professional associations are an essential part of any system of vocational education.'[9]

The Smith-Hughes Bill provided for the funding of vocational education programs by the federal government. It also provided for the appointment of a federal board for vocational education to administer the provisions of the Act. The seven members of the Board who were subsequently appointed came from all walks of life, labor, commerce, agriculture, the manufacturing industry, education, etc. The Board started off by dividing the country into five regions, namely, North Atlantic, Southern, North Central, West Central, and Pacific. An agent was assigned to each region. The agent supervised and accounted for the vocational education expenditure in each region. The Federal Board for Vocational Education was also charged with the responsibility of formulating policy on vocational education. Its first policy

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[8]Ibid, p. 69.

[9]Ibid, p. 90.

statement was published in 1917. Among other things the policy document limited the age of vocational students to a minimum of 14 years. The work of the Board resulted in increased cooperation between the states and the federal government. It confined itself mainly to three areas, namely,

(a) efficient administration of federal funds

(b) research for the promotion of vocational education

(c) assistance to the states in their promotion and development activities

By 1932 tremendous progress was reported to have been made in most states in the field of vocational education. But, the federal board which had done so much for vocational education, fell victim to the Great Depression during the 1930s. Economy measures forced the Board to relinquish its independent status and to become an advisory board with its administrative functions transferred to the Department of Education. There was no doubt, however, that the work of the Board had promoted the development of vocational education throughout the country.

The United States Office of Education did not stand by while all these developments were taking place. Until 1933, when the work of the federal board was assigned to the Office of Education, the role played by this Office was limited. Between 1933 and 1959 the vocational aspect of industrial education was handled by the Trade and Industrial Education Branch of the Division of Vocational Education. This branch stimulated considerable development by holding seminars and conferences and sponsoring various activities related to research.

In 1959, the Area Vocational Education Branch was established which had vocational interests in industrial education. Its primary area of concern was the production of highly skilled technicians such as those produced at polytechnic colleges in Zimbabwe. When the Vocational Education Act was promulgated in 1963 the door was open for major changes in vocational education.

Teacher Education

The training of teachers in the field of industrial arts in the USA started as early as 1873 at the Normal Art School. But it was not until 1891 that the first recognized course for training industrial teachers was introduced at the New York College of the Training of Teachers later to be called Columbia Teachers College. By 1918 there were as many as 184 institutions designed to prepare teachers for vocational education. Entry requirements were varied. Some colleges accepted high school graduates only, while others required only four years of trade experience. Others still required both. In one college a student who desired to teach a vocational subject spent three years as an indentured apprentice, worked two years in a trade, and then returned for 11 months to do his teacher training. At Bradley Institute, a teacher of automobile work completed one year of technical study, and then spent at least three months in a commercial garage. If his work was satisfactory he returned to Bradley for pedagogy and general technical courses. In every case a mastery of technical skills as measured by industry was required before the course could be completed. No effort was spared in ensuring that the teachers

produced were of very high quality. In 1928 a committee was appointed to look into the standards of attainment in industrial teacher education. When it made its first report in 1929, the following objectives were listed as fundamental to the success of teaching industrial education:

1. To develop in each pupil an active interest in industrial life and in the methods of production and distribution.

2. To develop in each pupil the ability to select wisely, a care for and use properly, the things he buys or uses.

3. To develop in each pupil an appreciation of good workmanship and good design.

4. To develop in each pupil an attitude of pride or interest in his ability to do useful things.

5. To develop in each pupil a feeling of self-reliance and confidence in his ability to deal with people and to care for himself in an unusual or an unfamiliar situation.

6. To develop in each pupil the habit of self-discipline which requires one to do a thing when it should be done whether it is a pleasant task or not.

7. To develop in each pupil the habit of an orderly method of procedure in the performance of any task.

8. To develop in each pupil the habit of careful, thoughtful work without loitering or wasting time.

9. To develop in each pupil an attitude of readiness to assist others when they need help and join in group undertakings (cooperation).

10. To develop in each pupil a thoughtful attitude in the matter of making things easy and pleasant for others.

11. To develop in each pupil, a knowledge and understanding of mechanical drawing, the interpretations of conventions in drawings and working diagrams and the ability to express his ideas by means of a drawing.

12. To develop in each pupil elementary skills in the use of the more common tools and machines in modifying and handling materials and an understanding of some of the more common construction problems.[10]

The twelve objectives became the Magna Carta of the teaching profession in vocational education thereafter. A reputable scholar of industrial education has said about these objectives,

> It is probable that no other publication in the field of industrial arts has been used by so many teachers and administrators.[11]

The significance of these objectives lies in the universality of their appeal and applicability. Whatever ones political perspectives, one cannot fail to recognize the fact that a student who embodies all of these at the end of his course approximates the ideal in industrial education.

After World War II a revised list of objectives was hammered out. The following became the new list:

1. Interest in Industry: To develop in each pupil an active interest in industrial life and in the methods and problems of production and exchange.

2. Appreciation and Use: To develop in each pupil the appreciation of good design and workmanship and the ability to select, care for, and use industrial products wisely.

3. Self-discipline and Initiative: To develop in each pupil the habits of self-reliance, self-discipline, and resourcefulness in meeting practical situations.

4. Cooperative Attitudes: To develop in each pupil a readiness to assist others and to join happily in group undertakings.

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[10] M. E. Barlow, opcit. p. 182.

[11] Ibid.

5. Health and Safety: To develop in each pupil, desirable attitudes and practices with respect to health and safety.

6. Interest in Achievement: To develop in each pupil, a feeling of pride in his ability to do useful things and to develop worthy leisure-time interests.

7. Orderly Performance: To develop in each pupil the habit of an orderly, complete, and efficient performance of any task.

8. Drawing and Design: To develop in each pupil an understanding of drawings and the ability to express ideas by means of drawing.

9. Shop Skills and Knowledge: To develop in each pupil a measure of skill in the use of common tools and machines and an understanding of the problems involved in common types of construction and repair.

This set of objectives, which was applicable nationwide, proved invaluable for program development. Moreover, it was now possible to use a standard evaluation since all industrial teacher education institutions shared common objectives.

The War Years

As early as 1938 the War Department started to meet with representatives of trade and industrial education to discuss ways and means of providing training for aviation mechanics and other craftsmen required for the war effort. High on their agenda, was the extent to which vocational schools facilities might be made available for emergency training. As a result of these discussions a committee was appointed to expand the training program for the war effort. Right through World War II, the regular industrial education program was conducted along with war training classes. There was a rapid adjustment of the nation's

trade and industrial war production which went on around the clock and seven days a week. After the war, another fast adjustment to peacetime conditions was made. The 1950s ushered in the era of the technician. Preparations were made to meet the requirements for a large number of technicians required for the labor market. The Vocational Education Act of 1963 prepared the ground-work for increased service to more of the nations youth, who had to have appropriate training in order to meet the employment requirements of the 1960s automated society.

Technical and Industrial Education of Women

During the last century, a few women championed the cause of womens education in America. Such women as Catherine Beecher (1800-1878) and Mary Lyon (1797-1849) proposed some daring innovations in the education for women. Early this century the National Society for the Promotion of Industrial Education appointed a committee to look into the question of industrial education for women. By 1910 there were 19 trade and industrial schools in the country which catered to women. The establishment of schools to provide instruction of an industrial nature for women was obviously a reflection of the needs of the time. Among the pioneer women in industrial education were Elizabeth Fish (1875-1939), Hellen Rebecca Hildreth (1864-1921) and Helen Livingstone (1889-1958). These women played an outstanding role in promoting womens industrial education as principals of industrial education schools or office holders in influential

positions affecting the training of women. It is noteworthy to point out the common features of these women. They were all very well educated and all shared a deep sense of concern for the education of women in industrial education.

At the end of World War I, it became clear that women were capable of doing more industrial work than was previously thought of. More schools now became prepared to enroll women in industrial education. The objectives of such training became three-fold:

1. to prepare the girl to enter the field of wage earning,
2. to enable the girl or woman already employed to improve or to change to a more congenial or profitable occupation, and
3. to insure progression or advancement in the type of work in which she is already engaged.

These objectives were directed toward improved products, increased output, higher wages and better standards of living. By 1930 the enrollment of women in trade and industrial schools exceeded 225%.

World War II started while the effects of the Great Depression were still being felt. This means that large numbers of men were still out of employment. Therefore, women were even worse off. But, the war effort demanded a lot of manpower. By October of 1942, 74,675 women were enrolled in war production classes. By 1943, the average monthly enrollment was 48,383. At first women were trained for the lighter work, but in time they were trained for all work across the board. The earlier practice of segregated vocational education for women gave way to complete integration. The total number of women trained during the entire

war period reached 1,501, 453 which was 20% of all the vocational work offered. Women trained in welding, the automotive field, aviation, electrical engineering, ship building, sheetmetal, radio and communications, etc.

This war experience did much to dispel the prejudices about the kind of work women could do or could not do. Employers developed new attitudes toward women, placing emphasis on quality of work done and not on the sex of the employee, during the post war period. Thus, up till the sixties women increasingly became an important factor in vocational education and on the labor market. This has been made possible by the excellent relationship between labor and industrial education. It would seem that the mutual dependency between labor and industrial education is key to the success of vocational education in the USA.

The Post War Period

One of the difficulties we have is to define precisely what technical education is and how it differs from vocational education. 'Technical' seems to have a strong scientific emphasis and implies a knowledge over and beyond manipulative skills characteristic of vocational education. Technical knowledge alters mans environment while industrial education is engaged in providing a means of satisfactory adjustment to the changed environment. The experience of World War II emphasized the need for an expanded program of technical education. During the post-war years, considerable emphasis was placed on technical-vocational education. The beginning of the space-age had much to

do with this development. In September 1958 the Defense Act was passed. It emphasized the need for the extension of vocational education to residents of areas inadequately served. The Act further provided assistance to State Boards of Vocational Education to enable them to provide technical and related technical training for both adults and older persons designed to prepare them for useful employment as technicians or skilled workers in scientific or technical fields. At the national level, attention was focused on technical education in the Area Vocational Education Branch of the Division of Vocational and Technical Education. Immense interest was generated in this field with enrollments in technical schools growing rapidly.

During the Kennedy era, the Morse-Perkins Act or the Vocational education Act of 1963 as it is sometimes known, was passed. It was the culmination of the work of a panel of consultants appointed by President Kennedy in 1961 to conduct a comprehensive study of the problems faced by vocational education. The panel itself consisted of persons of diverse backgrounds, teachers, businessmen, industrialists, labor, state and federal government employees, agriculture, racial minorities, boards of education and other professional association representatives. This diversity was important because it represented a wide spectrum of opinion. The Act itself differed from previous Acts in that it focused on services to people, i.e., meeting the needs of individuals in contrast to prior acts which only provided for

training personnel in a few occupational categories.[12] The aim of this Act was to provide services to people without regard to predestined occupational groupings. Occupations such as those requiring a B. A. degree were not included among those for which training was to be provided. The Act also increased funds for program development and for research which had strong influences on the progress of industrial education.

One of the provisions of the 1963 Act was a periodic review of vocational education programs. Accordingly in 1966 the Secretary of Higher Education and Welfare appointed an Advisory Council on Vocational Education. It made recommendations, the majority of which were incorporated in the 1968 Vocational Education Amendments. The amendments provided for the creation of national and state advisory councils. It also provided for a variety of areas affecting vocational education such as curriculum development, research and training, exemplary programs, etc.[13] In 1976, some amendments were made to the 1968 Act. Thus, for over half a century, vocational education in America has been 'fine tuned.' Hardly a decade has gone by without it being reviewed.

The development of vocational education in the USA can be attributed to a variety of factors. These include the enthusiasm of individuals such as Prosser, Barlow, and many others, the

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[12]M. E. Barlow, Legislative History of Vocational Education, published by the National Association of State Directors of Vocational Education Conference, Dec. 1981, p. 5.
[13]Ibid.

interest and participation of the American Federation of Labor, (AFL), congressional responsiveness to the issue of vocational education, and the work of professional associations. In all this, the key to its successful development has been research. Research work enabled policymakers to evaluate the performance of programs being implemented and to determine in what ways they could be improved. The cooperation between the states and the federal government has also helped to foster realistic vocational education programs. In the Zimbabwean context we can identify certain areas which can benefit from the background we have narrated.

The level of scholarly research into vocational leaves much to be desired. Scholarly papers on new vocational education programs such as the Belvedere Teachers College courses should be written, presented, and debated at vocational education professional conferences. We have tended to send people to various countries to see vocational education programs in a tourist fashion and to rely on their reports. We also need to establish a vocational or technical education association which will sponsor conferences and publish a journal in an effort to disseminate information. The inclusion of industry in the technical education conference held at Montclair Hotel is laudable. The eventual formation of an advisory council which consists of persons of diverse backgrounds such as those who attended the Montclair conference may not be a bad idea. Such an advisory body could advise both ministries of education as well as

government. This would facilitate the coordination of efforts by government, the two ministries of education, industry, and the ministry of labor to realize the objectives for which vocational education has been introduced.

Current Trends in Vocational Teacher Education

The preparation of vocational education teachers has followed many approaches. Significant in the selection process for vocational teacher trainees is the requirement that all applicants must have several years of work experience in the field for which they wish to train as teachers before they can be admitted. According to Dr. Ray Ryan, Executive Director of the National Center for Research in Vocational Education, at The Ohio State University, almost all states now require prospective public vocational teachers to have from three to six years or more of full time significant occupational experience prior to teaching.[14] This requirement implies that a teacher trainee must first master the skills which he is to be taught how to teach before he can be considered for the teaching profession. This is important because unless technical skills are mastered it is not possible to expect good teaching from student teachers.

In the U.S. some vocational teachers join the teaching profession from business and industry. Very often they have extensive experience in a specific trade. They must still take

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[14]R. D. Ryan and F. C. Pratzner, Context of Vocational Education, 1988, p. 40-41.

between 16 and 200 clock hours of methodology and pedagogical instruction concurrent with their first year of teaching. They must also continue to enrich their professional skills to maintain their state certification. Generally this instruction is offered by a college or university teacher education program and the credits so earned may be applied toward a B.A. degree.

At The Ohio State University for example, there is a department which offers vocational technical education to teacher trainees. They enroll two types of students, those who may not have a high school certificate but have worked in a trade for at least five years and those who have a high school diploma and have five years experience come to college on a kind of inservice arrangement. The teaching practice supervision is done once every two weeks and takes half a day each time during the first year. The students spend 30 days at the college initially before going into the field. During the second year students are supervised once a month again for half a day each time. During the third year there is no more supervision but students must come to the college to take pedagogical courses on a part-time basis. Then they get their teaching certificate but the certificate expires after four years unless the teacher takes more inservice courses. In that case he may eventually earn a B.A. degree in eight or so years. This is the program for the inservice program.[15]

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[15]Interview with Dr. A. J. Miller. Chairman, Department of Vocational Education, The Ohio State University, Sept. 1988.

The other program caters to students who go straight for the four year B.A. degree. They do observation for six weeks during the first year, teaching practice for six months during their second year and another six months during their third year. There is no teaching practice during the final year. Among the courses offered are those in the history and philosophy of vocational education as well as those dealing with the contemporary nature of vocational education.[16]

The Ohio State University also has two important departments, namely Home Economics and Agriculture departments. Home economics and agriculture directly affect the welfare of every home particularly in developing countries hence their importance to us. The agriculture school at Ohio State is one of the leading ones in the entire country. Both these departments have teacher training programs which are similar to the vocational-technical education program which we have already discussed. In each case, the teaching certificate, once acquired, cannot last for ever without renewal. It must be renewed every four years by taking additional inservice courses. This ensures that ones teaching experience is continuously being regenerated.

There is every likelihood that the training of teachers might still undergo some changes. According to Dr. Ryan, Executive Director of the National Center for Research in Vocational Education, at the Ohio State University, drastic changes could

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[16]The Ohio State University, Procedures Manual, Comprehensive Vocational Education 1985-86, p. 6.

take place if the recommendations of the Holmes Group and Carnegie Forum are accepted.[17] The Holmes Group is just one of a series of studies spotlighting the issues which affect the training of teachers in 1986. In their report, the group recommended that:

(a) education programs of teachers need to be intellectually sound

(b) programs need to be designed to recognize differences in knowledge, skill, and commitment

(c) standards need to be established which are relevant and defensible for entry into the profession

(d) teacher education programs need to be connected with secondary schools

(e) schools need to be a better place for practising teacher in which to learn and work[18]

There is also a move by major research institutions of higher learning to require a five year preparation program for teachers. Efforts to upgrade the selection, preparation, certification, and remuneration being made could also have important implications for the future of teacher education. The broad conceptual base of teacher education was, in the past, frequently incompatible with the more specialized technical courses. Teacher education students frequently lacked the prerequisite courses necessary to take advanced technical courses. These issues are being resolved by upgrading the selection of teachers to be. According to various scholars in the field of technical teacher education in

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[17]R. D. Ryan and Frank C. Pratzner, Vocational Education, Occasional paper, page 40-7.

[18]L. D. Anderson, J. Smallwood, and P. Vongang, "A Program for Preparing Teachers of Industrial Technology," The Technology Teacher, May/June 1988, p. 6.

America, the design and implementation of programs to prepare the technology teacher of the future is one of the most challenging and interesting developments of the profession. College teacher educators have the responsibility to seriously review and implement current trends in the philosophical and curricular development of the profession.

The expansion rate of vocational education in America is a sign of the importance of this aspect of American education. Between 1970 and 1981, the enrollment figures in federally supported vocational and practical arts education rose from 8,793,960 to 16,861,828. This rate of growth is approximately 10% per year. Over 150 occupations are taught under six different categories, namely, agriculture, business and office, marketing and distribution, health, home economics, and trade.[19] The impetus to such phenomenal expansion must be found in a variety of factors such as the sheer growth and changing patterns of technological advancement in American society, the need to acquire marketable skills by the unemployed, the desire for those already in employment to upgrade themselves and the combined initiative by the state and federal governments to ensure that the program of training teacher keeps pace with the needs of the time.

One interesting aspect of the postsecondary school vocational program in America is what is known as cooperative education. Under this program, college students, usually in business courses

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[19]R. D. Ryan, "The Systems and Methodologies of Vocational Education in the USA," Occasional paper, 1988.

go to school full time or part-time. The college gets them part time jobs with nearby firms where they work, putting their business theoretical knowledge into practice. The part time work experience is given credit by the college as it gives the students the necessary practical skills needed for the world of work.

Technical teacher education in America has many interesting features which would be of interest to a developing country like Zimbabwe. One feature is that recruits into the teacher education program in the technical field must have had several years of experience in the technical/vocational field. This is sound policy because it means that the trainee students can concentrate on pedagogy and the practical application of methodology as well as polishing up their vocational skills rather than starting to learn the trade as they begin their pedagogy. In Zimbabwe trainee teachers generally start to learn the trade at the teachers college. So they learn the skills of the trade concurrently with the pedagogy. But there is no better way of doing it in the Zimbabwean context because at independence, we inherited an educational system which expressly denied technical education to Africans. Consequently, there are no young or old people with technical skills who could be recruited for the teaching profession as there are in America. However, because our students spend the first year at college, the second year on teaching practice, and the third back at college, the quality of their technical skills during their teaching practice is quite poor. They are virtually trying to teach skills which they themselves

have not mastered. We should, therefore, explore the possibility of allowing students in technical teachers colleges, i.e., Belvedere and Chinhoyi, to remain at the college for the first two years of their training and go on teaching practice during the third year. This will enable them to consolidate their own skills before attempting to teach them.

The other feature I find interesting is that which requires certificants to renew their teaching license after every four years by taking inservice courses. Zimbabwe does have a variety of staff development programs which inservice our teachers and lecturers. But the diploma which worries me is the BEd (Bachelor of Education) diploma. The general view in the Ministry of Education seems to be that it does not produce the highly qualified person expected to teach in technical and other teachers colleges in the long term. For now it is serving a useful purpose because there are no better qualified people for teachers colleges. One way of improving the quality of those who have taken the BEd degree is perhaps to provide university courses which one can take on a part time basis over a number of years until he qualifies for a bachelors degree.

One problem I see with our system is that it has not managed to inculcate the work ethic in the majority of our graduating students. Driving in the countryside and in the urban areas one is struck by the large numbers of teachers either drunk or revelling at bottle stores and pubs, during week-ends or after working hours. During weekends, teachers of technical subjects

such as woodwork, building, home economics, agriculture etc. could be spending their time profitably by working on their trade. Carpenters could be making furniture which they can sell profitably. We are not suggesting that all leisure time should be spent on the work bench but we are saying that all leisure time seems to be spent in drink and away from home. Is it not our education system and the values we have inculcated that produce this kind of teacher? Although we are not making concrete proposals we are raising the question for discussion on this national problem. As one scholar has said,

> The concept of social efficiency in education calls for the direct teaching of knowledge, attitudes, and skills intended to shape the individual to predetermined social characteristics. It presumes to improve society by making its members more vocationally useful and socially responsible.[20]

If this doctrine is acceptable, then the Zimbabwean educator has a responsibility to train our youth in such a way that they can be as productive as possible. We must train them in such a way that they can play responsible roles in society. If the training system fails to influence the value judgements of the students it serves then it has failed to attain half of its objectives. The Zimbabwean model which requires that each student in a technical teachers college is required to take one technical and one academic subject on top of his pedagogy is laudable because it provides for the integration of the technical and the academic which is more likely to produce a more rounded citizen.

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[20]W. H. Drost, David Snedden and Education for Social Efficiency, Madison University Press, 1967, p. 3.

Secondary Vocational Education

Vocational education is offered at approximately 17,000 secondary schools in America. Its four main goals at the secondary level are to:

(a) provide the skilled workers needed by society

(b) increase the work-related options of trainees

(c) increase the face validity of general education, and

(d) enable trainees to improve their working conditions.[21]

Most of the vocational secondary institutions share the objectives above. Although they may vary in their emphasis. The enrollment in the 17,000 schools which offer vocational education jumped from 6 million to 10 million between 1970 and 1980. Basically, there are two types of schools for vocational training at the secondary school level in the USA. One is a school that provides vocational education as part of the comprehensive high school program. The advantage of this type of program is that there is greater interaction among students and faculty in all areas of instruction. The other type is the separate area vocational school which is supported by a local school district or a group of school districts. In this school students are bused to the separate area school where they receive instruction in occupational as well as academic subjects. The system ensures an optimum use of resources and has had a wide appeal in America. The fact that these schools generally have modern equipment attracts highly qualified instructors.

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[21]R. D. Ryan, Opcit. p. 7.

Programs of a vocational nature either in the comprehensive school or in the separate area vocational school are usually two years long. As vocational education is designed mainly for adults there is very little vocational education below the ninth grade, save home economics, industrial and career education which are taught as part of the general education curriculum. Vocational education at the secondary level is the only formal system of job preparation for youth in America. It is the only avenue by which youth can acquire education and training for work that requires less than a university degree. This program is therefore useful to students who do not intend to take up professional training at a two-year community college or at a four-year college. Sometimes students take vocational courses at the high school in order to enhance their opportunities for shortening time or gaining "advanced skills" articulation in their local community college or vocational/technical institution. Such courses give them advanced placement in their college courses.

Ideally, the skills taught should be closely related to new opportunities in the labor market. For example, in Cleveland, Ohio there is an aviation high school which specializes in aviation courses. There is also, in the same city, a new medical technology high school.[22]

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[22]Elizabeth Gardina, Changing Vocational Education to Impact on Youth in Urban Areas, National Center for Research in Vocational Education, 1982, p. 2.

The Great Oaks Experience

One of the most effective methods of training high school students in vocational courses which has been devised in America is that of the comprehensive high school. Because of the high input costs involved in setting up vocational education institutions, the Americans have devised a method which reduces costs substantially. In various states they have set up a well equipped vocational high school which serves several schools from several counties in each given area. Great Oaks in Cincinnati, Ohio, is one of the best such schools. It has achieved world fame since it was set up in 1973 and now boasts of receiving important visitors from all over the world. Some visitors have come from as far away as India, Singapore, and Turkey. I was probably the first one from Zimbabwe.

Great Oaks is recognized in the whole world as a leader in providing excellent vocational programs. It serves 12 of the 88 counties in the state of Ohio. A county is the equivalent of an administrative district in Zimbabwe. The school serves 35 school districts which is the largest served by any school in the world. Students enrolled in various schools enroll for vocational courses at Great Oaks while pursuing their academic studies At their district schools. They are bused to Great Oaks and back for their vocational courses. Only juniors and seniors, the equivalent of form threes and fours in Zimbabwe take vocational subjects at the high school level. Great Oaks offers seventy different courses in

the field of vocational education. Additionally, Great Oaks provides a wide variety of training programs and assessment services for business and industry and for individual adults.[23] Its students benefit from a complete educational program featuring highly qualified instructors, state-of-the-art equipment and curriculum that is constantly updated to keep pace with changing technology. Challenging mathematics and science, as well as technical communications courses focus on key concepts which students must master if they wish to achieve success. This unique practical approach to learning, helps students understand why these concepts are important and how they are applied in the occupational field they are preparing to enter.

Great Oaks has four different campuses, namely:

(a) Diamond Oaks

(b) Laurel Oaks

(c) Live Oaks, and

(d) Scarlet Oaks

Each of the campuses specializes in different fields from the others. For example, microcomputer and business management courses are found at Scarlet Oaks which also offers many others such as nursery education, dentistry technical courses, travel consultancy, electronics, welding, metal work, wood work, building, motor mechanics and graphics. At another campus one will find such courses as agriculture, wild life management,

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[23]Interview with Dr. Harold L. Carr, Superintendent, October 14, 1988.

cosmetology, custom upholstery, hotel management, tailoring, nursing assistant training, firefighting training, law enforcement courses, and medical assistant education. At Diamond Oaks one would find such courses as building maintenance, computer assisted drafting, electro-mechanical appliance maintenance, machine trades, horticulture, horsemanship, and many others.

It should be emphasized here that students of vocational subjects must also take mathematics and science which complement their vocational courses. About 4,000 high school students take courses at Great Oaks every year. It is estimated that nearly 25 percent of students at each of the 35 school districts served by Great Oaks take vocational courses at the school. Most of these students pass their courses. A survey conducted by The Ohio State University shows that 90 percent of Great Oaks graduates readily find employment while only 72 percent of those who finish high school without taking vocational courses readily find employment. The survey also found out that the Great Oaks graduate earns a salary which is 21 percent higher than that of the ordinary high school graduate.[24]

Much of the success of Great Oaks lies in the support it receives from private industry. Each course offered at Great Oaks is monitored by what is known as a craft advisory committee. The committee is composed of representatives from business and industry as well as education and state representatives. These meet three times a year and make recommendations to the Board of

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[24]Ibid.

Education. Because of its involvement in the Great Oaks programs, business and industry donates great quantities of equipment to the school. For example, IBM has donated many computers to the school. Ford and Chrysler Motors have donated cars, both new and old, to be used in the workshops for training auto mechanics. This way, the responsibility for equipment does not entirely lie on the Board of Education.

As has already been indicated, Great Oaks has a program for training adults from various companies and corporations. Last year it trained as many as 70,000 people from various companies. Successful companies know that people are their most important resource when it comes to increasing productivity and remaining competitive in today's fast paced business environment. Great Oaks provides training and assessment services for business and industrial clients and also meets the individual needs of citizens. The school has a full service adult vocational education center and meets human resource development in southern Ohio. A wide range of courses are offered to private industry trainees. These include engineering drafting, police training, firefighting, diesel mechanics, emergency medical training, industrial construction, aviation technology, home economics, agriculture, etc.

So, Great Oaks has a two pronged approach namely, the training of high school students in vocational education and the training of adults sent by companies or those who come as individuals. An interesting aspect of the Great Oaks program is

the recruitment of teachers who give instruction to the students. Teachers recruited to teach high school students or adult education courses should have had at least seven years of trade experience. In other words they should have been working in their trade for at least seven years. Before they start teaching they must attend a summer workshop which lasts six weeks. At the workshop, the students learn the methodology as well as related subjects such as psychology and philosophy of education. In the state of Ohio there are five teacher training centers. Teachers with no degrees get temporary licences to teach. They can improve their qualifications by taking a series of inservice courses. Those who come with degrees can teach without attending the workshops. But they too need to attend inservice courses before their teaching license can be considered permanent.

There is no doubt that Great Oaks is one of the very best vocational institutions in the world. The program there is so rigorous that the students have only thirty minutes for lunch and there is no free period during the whole days program. This enables the school to produce employable and efficient craftsmen at the end of the program, which, in the high school lasts only two years. During these two years, students attend classes five days per week. In this way the work ethic is efficiently inculcated. Moreover, Great Oaks is sensitive to the demands of society. It caters to trainees in community services as well as those preparing to enter business or private industry. Its programs are periodically reviewed to ensure that they are

consistent with the demands of an ever changing society. There are a hundred and one things that Zimbabwe and many other third world societies which are interested in vocational education can learn from Great Oaks. We shall look at those lessons at a later stage.

Two Year Technical Colleges

The USA has many two-year technical colleges similar to our polytechnics in Zimbabwe. During the sixties, it became clear that there was a need in industry for the creation of a technician who would fill the gap in between the engineer and the workers. In the medical field a laboratory technician would fill the gap in between the doctor and the nurse. The development of high-tech has increased the need for technicians in practically every field in industry. This has necessitated the expansion of technical colleges. In the state of Ohio, there are 23 such colleges. While these colleges are dedicated to the development of programs which address the expressed needs of business, industry, education and the nation, their most important obligation is their development of human potential.[25] They base their goals on the premise that education is a process, a life-long process through which individuals can enhance the quality of their lives and make a meaningful contribution to society. Their goals can be divided in three categories, namely, educational, community and employment goals. The ultimate education goals is to encourage the students to think independently and critically, to develop their problem

[25]Catalog for Northwest Technical College, 1988/89, p. 3.

solving abilities, to communicate effectively and to attain the marketable skills necessary for a productive life. Their community goals stem from their belief that America's freedom depends upon an educated populace able to make difficult decisions and willing to accept responsibility for their actions. The colleges therefore, try to remain attuned to the needs of their constituents. Their employment goals view a college degree as an educational foundation upon which one can enter, master, and even change careers while enjoying a satisfying and productive life. They also recognize their obligation to respond to the shifting employment needs of the American economy.[26]

One such college is Northwest Technical College in Ohio. This college serves five counties, i.e., Williams, Fulton, Defiance, Henry, and Paulding.[27] It is governed by nine board members, three appointed by the Governor of the state of Ohio and six elected by a caucus of school boards in the area. The college offers courses under four broad areas. These are business, engineering, health and general studies, which caters for such courses as child care programs and liberal arts courses. Engineering courses would include, drafting and design technology, mechanical engineering technology, industrial management and technology. Business programs include accounting technology, agriculture technology, business management technology, computer programming technology, office services technology, and food

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[26]College Mission/Philosophy, Northwest Technical College, 1988/89. p. 1.

[27]Interview with College President Dr. Miller, October 14, 1988.

processing technology. It also has an accounting component. Under each of these, many different courses are offered.[28] At the end of the two years successful candidates receive an associate degree in their field of specialization. It may be pointed out here too that the use of computers is common in virtually every field. So all students end up taking computer education courses relevant to their field of specialization be it engineering drafting, secretarial, or legal drafting. "The typewriter is becoming obsolete," says the president of the college, Dr. Miller.

Zimbabwe's Vocational Education Program

Unlike the American vocational program which has systematically grown from strength to strength during the course of this century, Zimbabwe's program is in its infancy because colonial education denied vocational and technical training to Africans. During the early years of colonial rule, the settler government, approved the training of Africans by missionaries as a way of denying them academic education which was considered 'dangerous' to the long-term interests of colonial rule. The 1899 Education Ordinance stipulated that industrial education was to form the major component of African education. But no government school of any kind was opened until 1921 when Domboshawa Government School was started. Domboshawa specialized in the training of Africans in the field of agriculture. Another school, Tjolotjo, was opened in Mataleeleland in 1922. It also trained

[28]Ibid.

Africans in agriculture. The colonial government considered that industrial education for people who had no secondary education had the advantage that it prepared Africans to serve in a subservient capacity as laborers but never as employers or owners of the means of production. In 1918 the Chief Native Commissioner of Rhodesia pointed out,

> The native should be trained not so much as a competitor with the whiteman in the business of life but as a useful auxiliary to help in the progress of the country.[29]

So, to the settlers, the African had to be carefully guided to acquire habits of industry so that he could serve in a subservient capacity for a long time. One of the Native Commissioners who was asked to help shape the curriculum for such industrial schools was Keigwin. In designing the curriculum for industrial schools, Keigwin boasted that he had,

> deliberately sought out those industries that lend themselves to primitive hand methods rather than to progressive and highly productive machinery. One had to remember that what was wanted among backward natives was something of this old fashioned craftmanship of 50 to 150 years ago.[30]

Booker T. Washington had something to do with these colonial policies. In 1924 a Phelps Stoke Fund Commission visited many African British colonies. It recommended that the colonial government should give attention to industrial education for Africans. It cited Booker T. Washington's teachings and his Tuskeegee model as the basis for their recommendations.

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[29]Ibbo Mandaza (Ed). The Political Economy of Transition, Cordesia Book Series, Dakar, 1980, p. 322.

[30]Ibid, p. 323.

Many mission schools offered industrial education, mainly in woodworking, building, and agriculture to their Africans. Mt. Silinda Mission and St. Augustines, both in Maniealand were some of the most successful in this endeavor. These schools offered industrial training to students who had completed elementary or primary school. At that time people completed primary school, sometimes, at the age of twenty or even older. The industrial course lasted between two and three years.

There were virtually no opportunities for technical education for Africans in Rhodesia. The Skilled Manpower Development Act and the Industrial Conciliation Act prevented Africans from training and working in the technical field. The Rhodesian Government response to a shortage of skilled labor was a campaign for white immigrants. Although the 1959 Apprenticeship Act legalized the training of African apprentices resistance by white employers and white trade unions made it impossible for large numbers of Africans to be apprenticed. Whereas 53 whites were apprenticed between 1962 and 1969 only 49 Africans were apprenticed during the same period.[31] A technical college which was opened at Luveve, Buiawayo, in 1961 was forced to close even before its first class completed their course because of pressure from government right wingers. Although the University of Zimbabwe trained engineers on a non-racial basis, the failure rate among African students who constituted a very small number was high and considered 'unnatural' by Africans.

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[31]Ibid, p.

The Post Independence Period

When Zimbabwe gained its independence in 1980, it gave priority to expansion in the field of education. Between 1980 and 1988 the total enrollment figure for both primary and secondary education jumped from 900,000 to over 3 million. But even in 1980, it became clear that technical/vocational education would have to be addressed seriously. Government immediately embarked on the construction of technical colleges in all the cities and towns while expanding the two existing technical college in Harare and in Bulawayo which had now become multi-racial. The new technical colleges were built in Mutare, Gweru, Kwekwe, Masvingo, and Marondera. While studies were being conducted for the introduction of technical/vocational education, government immediately started to build a technical teachers college, Belvedere, to prepare teachers who would teach technical subjects in the school system. The college which had its first intake in 1983 graduated that first class in 1986. It offered woodwork, metal work, technical graphics, agriculture, home economics, building, and physical education. Another technical college, Chinhoyi, is under construction right now. It is due to take in its first class in 1989. Between 1980 and 1987, the Ministry of Education in Zimbabwe organized numerous workshops and conferences to try and work out a new structure of education that would reflect a bias toward technical/vocational education. The Education Review Committee of the then Ministry of Education and Culture of 1982 projected an '0' level graduate figure of 172,314

by 1994 as opposed to the 17,579 figure of 1983.[32] The same committee projected the total number of unemployed school leavers at 2.304 million using the most optimistic assumptions of economic growth and 2.395 million using the less optimistic scenario.[33] Unfortunately the committee did not show any sensitivity to the need to prepare secondary school students for the job market by introducing a vocationally biased curriculum in the school system. In their conclusion to the report they wrote,

> "The Review Committee wishes to emphasize the need for a program of job creation based on substantial investment into the formal as well as the non-formal economic sectors in order to obviate the forseen crisis of having more unemployed than employed."[34]

Nothing was said about vocational education.

The report of a conference on education transformation held at Gweru Teachers College between May 2 and 4, 1985 reveals that both the Ministry of Labor, Manpower, Planning and Social Welfare, and the Ministry of Education were alive to the need for introducing vocational education at the secondary school level. A paper presented by Dr. E. P. Manyuchi, director of vocational and technical training in the Ministry of Labor, Manpower, Planning and Social Welfare, raised four points;

1. that the Ministry of Labor, Manpower, Planning and Social Welfare had created provisions for the training and coordination of Zimbabwe's skilled personnel through the Division of Vocational and Technical Training.

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[32]Ibid, p. 27.

[33]Ibid, p. 28.

[34]Ibid.

2. that it was important to teach vocational subjects at secondary school level in order to sensitize the school pupils as to the nature and type of course offered in technical institutions

3. that the teaching of vocational subjects in secondary schools should not be done at the expense of other general subjects. A happy balance in the school curriculum between vocational subjects and academic subjects is possible.

4. there was a need to integrate the curriculum for the secondary schools, vocational schools, technical colleges and the university in order to allow an easy transfer of students from one system to another.[35]

Other speakers stressed the need for vocational education in the schools. Citing examples from Tanzania and other countries. At the end of the conference, it was clear that the pursuit of such education was to gain momentum from then on.

In 1986 the Ministry of Education sent three Deputy Secretaries to visit four European countries to study the implementation of vocational policies there. The three gentlemen visited the Socialist Republic of Hungary, the Social Republic of Czechoslovakia, Sweden, and the Federal Republic of Germany. In their report, the three gentlemen pointed out that although the countries they had visited had different ideological leanings and different socio-economic systems, they all had educational systems that linked education to vocational training. They also cited the involvement of industry in curriculum development as a positive feature of the education systems they had seen. They identified two advantages of involving private industry in vocational

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[35]Report of the Conference on Education for Socialist Transformation, May 2-4, 1985, held at Gweru Teachers College, p. 12.

education. One is that employers get to know the capabilities of their would-be employees, while the other is that such involvement reduces the cost of vocational training since industry donates machinery and other equipment to the schools in which they are involved. On the basis of their findings the three gentlemen recommended the introduction of a curriculum in our secondary school system which would have a technical/vocational component.[36]

In November 1986 the Ministry of Education followed up the recommendations of the three Deputy Secretaries by organizing a workshop on the structure and content of a new education curriculum in Zimbabwe. This workshop, which was attended by delegates from the public and the private sectors, met at Montclair Hotel in the Eastern Highlands between November 19 and 21. Among the organizations represented were the Ministry of Education, the Ministry of Labor, Manpower Planning, and Social Welfare, and the Confederation of Zimbabwe Industries (CZI). In his speech to the participants, the then Minister of Education, Dr. Dzingai Mutumbuka said,

> It is axiomatic that the most important resource of any country is its people--i.e., its human resources. Therefore the future and wellbeing of any nation depends upon the ability of its people to develop and exploit its total environment. This ability to exploit and develop ones environment, I submit, comes from how well one is prepared for this task through the education process. An education system should not only make people literate and numerate; it should also impart scientific, technological, and

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[36]Report on a Study Tour on Technical/Vocational Education in the Socialist Republic of Hungary, the Socialist Republic of Czechoslovakia, Sweden, and the Federal Republic of Germany, by S. C. Mbengegwi, I. M. Sibanda, and N. R. M. Tanyonyana, p. 5.

> manipulative skills for all those who pass through it. Most importantly, perhaps, it should equip its products for survival in an era when nothing has permanency.[37]

The minister went on to point out that his Ministry's field studies of the vocationalization of education in the developed countries had convinced his Ministry that the intervention of the commerce and industry in this process was a critical factor. He therefore called on these sectors to rise to the occasion and help shape the new content and structure of vocational education. The Deputy President of CZI, Mr. Morrison Sifelani, welcomed the Ministers call for the private sectors involvement saying that it was a recognition by Government that the educational system can not exist in a vacuum and that it must be sync with prevailing economic environmental factors.[38] He went on to point out that on many occasions the private sector had indicated to the Ministry of Education that industry was being handicapped by an acute shortage of skills. The many school leavers who inundated the labor market had no skills to offer what so ever. he echoed the ministers view that the school curriculum should be changed and adapted in accordance with the environmental factors affecting Zimbabwe given its needs, resources, in particular, the pace and level of industrial development. He however warned that careful planning, including a good management of the economy was essential if the proposed new structure of education was to achieve the purpose for which it was intended. He then urged that a new

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[37]A Report of the Workshop on the Structure and Content of Education in Zimbabwe, 19-21 November 1986, p. 6.

[38]Ibid, p. 26.

university, preferably in Matebeleland which might have a bias toward the sciences and technical education should be planned.

The recommendations of the three Deputy Secretaries who had traveled abroad were presented. These recommendations envisaged three stages of vocational education at the secondary level.

Stage I

Pupils completing primary education would proceed into Stage I of secondary education, which consists of Forms I and II. The curriculum would include a wide range of vocational and technical subjects in addition to the traditional academic subjects. The technical and vocational subjects offered would be determined jointly by the Ministries of Education and that of Labor, Manpower Planning, and Social Welfare to ensure that these subjects are in accordance with the demands of our commercial and industrial sectors. The leadership of industry and commerce was to be involved in the selection and development of the curricula. Every child would be required to take at least two technical/vocational subjects in stage one of their secondary education. It was appreciated that this would not be possible in every school because of the lack of equipment and facilities in some schools. The examination at the end of stage one would be set by the Ministry of Labor, Manpower Planning, and Social Welfare together with any other body responsible for the examination of technical/vocational subjects in Zimbabwe.

Stage II

Pupils would proceed into the second stage according to their capabilities and aptitudes as reflected in the Form II examinations. They would follow either a technical/vocational bias or an academic one according to their Stage I results. However, those specializing in technical/vocational subjects would be required to do a core of academic subjects together with academic streams. Similarly, those following academic courses would be required to do at least one technical/vocational subject. This means that both technical and academic courses would be offered in the same school. Again, the technical/vocational examinations would be administered by the same bodies which administered them at Stage I. This would ensure that school leavers at the end of Form IV have valid technical/vocational skills acceptable by industry and commerce. An added advantage was that those proceeding to polytechnic or other vocational colleges would have time remission on their studies since they will have done some of the work relating to their fields of study at school. This will shorten the postsecondary school training period and thus reduce the costs of manpower training in several fields.

Stage III

Stage III would consist of Forms V and VI, during which period studying academic subjects will have the option to include one vocational/technical subject and vice versa. Throughout

secondary education, academic subjects would continue to be examined according to the criteria laid down by the Ministry of Education while technical/vocational education subjects would be examined according to the criteria set by the Ministry of Labor, Manpower Planning, and Social Welfare or related bodies.

The Montclair conference accepted these recommendations. The target date of implementation was set at January 1988. Government was urged to look into the possibility of using some part of the Manpower Training Levy to support the implementation of the new programs. Representatives from the private sector urged that one Ministry should handle all technical education. Up till then polytechnic education fell under the Ministry of Labor, Manpower Planning, and Social welfare while the rest fell under the Ministry of Education. Recently, polytechnics have been brought under the Ministry of Education so that all technical and vocational training is now under one roof. It was also agreed that there should be joint participation in curricula development between the Ministry of Education, the public sector, industrial/ professional ministries and relevant organizations in the private sector. A concept called "twinning" which is a parallel of the American co-op system was also agreed on. Under this system students would have a 'hands on the job' experience with certain firms for a certain periods of time during their training.[39]

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[39]"The Structure and Content of Education in Zimbabwe," Speech by the Minister of Education, delivered at a Ministry of Education Workshop on The Structure and Content of Education at Belvedere Teachers College on July 29, 1986.

In January 1988 about 40 pilot schools were able to introduce technical/vocational subjects. Most of these schools were selected because of the existing infrastructure for vocational courses at the schools. It is envisioned that more suitable schools will be identified each year and with the growing number of qualified teachers graduating from Belevedere and Chinhoyi Teachers Colleges the new program will be implemented at a faster rate than it is now.

What the Zimbabwe Program of Technical/Vocational Education Could Learn from the American Experience

Earlier, we noted that three Deputy Secretaries who visited four European countries found similar features in their programs of technical/vocational education inspite of the fact that they had different ideological and socio-economic leanings. Similarly, one will find some useful features in the American technical/ vocational program. Zimbabwe could benefit from some of these features.

Philosophy and Literature

The first striking difference I have noted between Zimbabwe's program and the American one is that there is a wealth of literature on the development of vocational/technical education in America. Before any federal legislation was passed on vocational/ technical education, scholars did extensive research whose findings were passed on to the relevant congressional committees which based their decisions on the findings of researchers. This has been the case throughout the twentieth century. In America,

the role of research is considered to be an indispensable aspect of development. Many journals are devoted to industrial and vocational education. A National Center for Research in Vocational Education was created in 1978 at The Ohio State University in Columbus. Its function is to conduct research into vocational education and to supply the school system with materials on such things as effective delivery systems and testing methods produced by scholarly research. In Zimbabwe there is no serious research on vocational education. If one wants to write a paper he must base his conclusions on the Ministers or Secretary's speeches or on the proceedings of a workshop. Once in a while Ministry officials are asked to go and tour a country or several countries. Their reports are usually based on their observations.

The authors view is that Zimbabwe needs to encourage serious, scholarly research in this area. The only research work I know of in the area of vocational education in Zimbabwe is that of Dr. John Williams, a lecturer at Belvedere Teachers college. Such men should be encouraged to do more. I further suggest that the new journal being published by Belvedere Teachers College be devoted to technical/vocational education only. Contributions should be solicited form all those who wish to publish articles on technical/vocational education. Scholarly research will assist future generations to improve the structure of vocational education.

Moreover, vocational education in Zimbabwe lacks a coherent philosophy. Where as some may even doubt that it is necessary to

have a philosophy for vocational education, we insist that it must have an articulated philosophical framework. In the words of Melvin D. Miller, "the lack of a coherent philosophy could encourage opportunism and expediency."[40] Miller's fears that whenever this happens, vocational educators become unable to operate from a clearly articulated paradigm that reflects human and economics needs, a contemporary knowledge base and the values inherent in society. As is well known, philosophy encompasses the nature of human activity and the nature of the world. Specifically, we can say that philosophy has three main concerns. Namely, the nature of reality, truth, and value. Philosophy therefore becomes an articulation of fundamental assumptions about reality, truth, and value. It is therefore important that each vocational educator in Zimbabwe should have a philosophy of vocational education. Such a philosophy would provide guide lines for educators contributing to decisions about program development, selection of learning activities, curriculum goals, resource utilization, and identification of other needs and functions in vocational education. A philosophical view on the nature of the learner determines how learners needs are determined and suggests appropriate strategies for meeting those needs. We may add here too that philosophy is not merely an abstraction without relevance to vocational education. A philosophic view of vocational education sets parameters and guides policymakers in shaping up a

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[40]Melvin D. Miller, Principles and Philosophy for Vocational Education, The National Center for Research in Vocational Education, The Ohio State University, Columbus, 1985, p. 1.

vocational education program. It also serves as a yardstick against which the practices of vocational education can be measured. It provides a conceptual framework for thinking about vocational education's relevance to the human condition. A coherent philosophy which will meaningfully serve these functions can only develop as a result of prolonged research and dialogue. It evolves rather than shooting up overnight. So, Zimbabwe may not be criticized for the lack of such a philosophy since its program is in its infancy. But, workshops on vocational education must now start to focus on the philosophy and the nature of vocational education. Policy develops around these twin pillars. At teachers colleges such as Belvedere and Chinhoyi, the philosophy of education courses must incorporate a section on the philosophy of vocational education. The absence of such a component is a weakness in the curriculum. Lecturers must be sensitized to this need.

The Teaching Staff

We saw earlier that teachers recruited to teach at technical institutions such as Great Oaks, Northwest Technical College, and Cuyahoga, must have had between five and seven years work experience before they can teacher. It is interesting to note that in Zimbabwe we also insist on some experience, usually those who have studied at such vocational institutions such as Mlezu. They must also have taught in this trade for at least four years. But the American system insists that the teaching license be renewed every four years by taking inservice courses. The

Zimbabwean system takes care of this by sending underqualified staff members on staff development training either in the local university or overseas. This has worked very well whereever such lecturers successfully completed their courses. But several lecturers have failed their examinations at the local university and have simply returned to the colleges to continue with their work. The author feels that passing ones exams be made a condition of tenure at the colleges as is the case at the University of Zimbabwe. The American system is admirable in that it compels teachers who do not have tenure to keep on improving their professional life. Whereas Zimbabwe's system is quite commendable for such a youthful program it is clear that one loophole needs to be closed. Moreover sending our head of departments for a tour of some of the institutions we have mentioned together with vocational institutions in other countries can only strengthen our vocational programs.

Twining or Cooperative Education

Cooperative education in America is what would be termed twining in Zimbabwe. It involves students who are in a college or school, but who take up jobs with various firms for a limited period of time. A student studying business administration, may take up a job with a firm near the college on a part-time basis. The college actually gives him credit for the job which must be in his field of study. This gives the student a 'hands on' experience which is very useful for his professional growth. In Zimbabwe, policy makers have called the same concept 'twinning."

But, there has not been much being done in this area so far. We suggest that College students doing agriculture at technical colleges such as Belvedere be made to spend at least one holiday working at a state farm such as the Arda estates or the National Parks. Farmers could be encouraged to recruit some of them to work in middle management levels during the holidays. Other vocational areas could explore similar possibilities.

Special Technical High Schools

'Special technical high schools' is a term which we are using to denote those technical schools which serve several schools in a given number of counties. As we pointed out earlier, such high schools in America, are built to facilitate the training of high school students. But, because of the high cost of inputs in technical education, one school is built to serve as wide an area as possible. Students are then bused to the technical school for their technical courses. In the case of Great Oaks we noted earlier that it serves 12 counties and 35 school districts. The advantage of this system is that it minimizes capital expenditure on setting up the school. But it can work only if the schools being served have the transportation with which to send their pupils to the technical high school. In the Zimbabwean context, this would not be possible considering that the cost of purchasing a bus is in excess of $150,000 per piece. In such big urban areas as Harare, it should be possible to establish one big well-equipped high school to which students from the local schools can go for their technical education. Most schools in Harare have

school buses. This could be left to form threes and fours only. In the rural areas boarding technical schools could be considered. Ideally these could be built in each of our 81 districts. But, the relevant ministry could start by building one in every two districts. They would then admit students who reside in the designated districts only. Ministry could start by building one in each province for that matter. The important thing would be to avoid a situation whereby some provinces or districts are catered to while others are not. It seems to me that this is the best way of providing technical education in the rural areas. Clearly, those schools which have the facilities to offer technical education should be allowed to continue to do so.

Teaching Practice

Earlier, we noted that American technical schools and colleges place great emphasis on the length of a person's trade experience if he intends to be a teacher. In other words one must have mastered the skills required in a trade before he is allowed to stay and teach them to others. This is important. This principle is not observed in our teaching practice program. Our students come to college, i.e., Belvedere and Chinhoyi, with no background experience in the trade they intend to specialize in. After only one year the college sends them for teaching practice for a year. During that year, they are virtually teaching trades in which they themselves are deficient. Two things can happen. They can easily internalize the wrong things and the students they teach may also internalize the wrong things.

In the process of learning, once the wrong thing has been internalized, it becomes difficult to remove. It is therefore necessary for us to review our teaching practice program for technical colleges in Zimbabwe. My recommendation would be that we should allow students at technical colleges to remain in residence for two years at a stretch and go out on teaching practice during their third year.

The Involvement of the Private Sector

One of the reasons for the success of the American vocational and technical education program is that it is supported by a wide range of people and institutions ranging from the private sector to government. This is made possible by the fact that planners of vocational education have always involved people who represent each of these institutions. The Montclair Conference in Zimbabwe two years ago did just that. But it does not appear that after the conference the private sector was involved in the planning and execution of the new program of education which resulted from those deliberations. As long as the private sector is not fully involved, it will be reluctant to invest in the new program. Committees could be set up for each of the technical subjects the ministry plans to offer. The subject committee would then deliberate on policy affecting that subject and make its recommendations to the Ministry. The private sector and other bodies represented in these subject committees would therefore feel that they are part of the program. This in turn, could

encourage them to invest in the training of our youth by providing equipment to the schools.

The Need for a Nursery Program

Two years ago Belvedere Teachers College made a suggestion to the Ministry that it be allowed to raise funds to build a nursery school at the college which could be run as part of our teacher training program for Home Economics teachers. The recommendation was not accepted on the grounds that the work involved was too complicated. On a visit to Great Oaks Technical School, I was shown a nursery school run more or less on similar lines by the school. I thought it was an excellent thing to have such a school. I therefore recommend a rethink on the idea of the nursery school. It gives immense opportunities for students to train in child care, which most of the students will have to do in their homes anyway. Such schools do not have to be limited to technical teachers colleges. A college like Seke with an abundance of space could easily start a nursery school. But, the department of Home Economics must be able, interested, and willing to over see such a school.

Finally, there is considerable evidence in the American system to show that the head of an institution and his staff recommend to their superiors ideas which are designed to improve the institution. In most cases their superiors are receptive to these recommendations although this does not mean to say that such recommendations are always acceptable. But, the fact that they are on the spot and have to deal with the day-to-day problems of

the institution is given the weight it deserves. Our head office should perhaps show greater receptivity to principals recommendations requiring policy adjustments. In the case of the technical colleges it must be admitted that our program is new. Difficulties experienced at a college by a principal and his staff should only be used to modify and strengthen the college for the future well being of our educational system. Recommendations from a college should not be seen as criticisms. Greater freedom in the colleges will lead to greater creativity and initiative which can only give our students a more meaningful learning experience. For example, I feel that the Distance Education Center should now hire a small staff to do research work for technical teachers colleges. They should look at the curriculum and suggest ways by which it could be improved. They should be able to visit other countries and carry out extensive research work in the field of vocational education. This will ensure sustained growth in this very vital area. Policymakers should base their policies on data provided by researchers, hence the importance of research to the development of any educational program. The Third World is lagging far behind the developed countries in the field of technological development. Until, and unless we invest more time and money in this very vital field, the gap between us and the developed countries will not be narrowed. It should be appreciated that continued lack of technological development means continued dependence. No matter how much we denounce this dependence in our political economy textbooks, the situation will

not be altered until we ourselves have mastered the skills in this field.

In all fairness to Zimbabwe's technical/vocational program, policymakers have had a good foresight which has helped the program to reach the stage at which it is now. We however, should avoid complacency. The work ahead of us requires an even greater effort. I am sure Zimbabwe will rise to the occasion.

APPENDIX

Two Year Agro-Business Curriculum from Great Oaks High School.

Two Year Carpentry Curriculum (from Great Oaks).

Masonry, Two Year Curriculum (from Great Oaks).

Chef Training (from the Home Economics Department at Great Oaks).

Computer Assisted Drafting (Great Oaks).

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